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Further Notes on *Pellaea*¹

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The following notes relate chiefly to the distribution of several United States species of *Pellaea*. Incidentally a new name is given to the southwestern plant long known as *Pellaea aspera* (Hook.) Baker, which Christensen has renamed *Pellaea scabra*. This peculiar species was first described under *Cheilanthes* by Hooker, to which genus it clearly belongs, rather than to *Pellaea*, regarding *Pellaea* in substantially the same sense in which it was founded by Link.

PELLAEA COMPACTA (DAVENP.) MAXON.—In a recent paper² dealing chiefly with the taxonomy of the southwestern ferns usually associated under the name *Pellaea Wrightiana* Hook. the writer has taken up the name *Pellaea mucronata* D. C. Eaton for the common California plant long passing as *P. ornithopus* Hook. and has recognized two species in the Mexican border region, *P. Wrightiana* Hook. and *P. longimucronata* Hook., distinguished by characters which appear to hold invariably. Incidentally a new species, *Pellaea compacta*, is described from southern California, its relationship being with *P. mucronata*. Although *P. compacta* appears to be rare in herbaria it is said by Mr. S. B. Parish³ to be "frequent in the San Bernardino and San Jacinto Mts., growing in stony soil on dry slopes at 6000 to 8000 ft.," and to have been collected also in the Providence Mountains of the Mojave Desert. Its relationship to *P. mucronata*, with which it was supposed to grow, is clear; but Mr. Parish, writing recently from San Bernardino, remarks that there is a "marked limitation in the distribution of this fern and *P. mucronata* in

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² Proc. Biol. Soc. Washington 30: 179-184. 1917.

³ Fern Bull. 12: 8. 1904.

this region." He states that *P. mucronata* is there confined strictly to the Upper Sonoran Zone and to that part of it which he has called the Lower Chaparral Zone, and that in these limits it is exceedingly abundant. He adds: "I noted *P. compacta* as belonging to the Canadian Zone; but to be more exact, it may be said to occur also in the upper part of the Upper Transition. Its occurrence is frequent, but it is by no means so common and abundant as the other species. So far as my observation extends there is a geographical hiatus between the two species in which no *Pellaea* occurs. I have never seen any material that I could regard as intermediate." *Pellaea compacta* was described originally as a variety of *P. Wrightiana*, to which species and *P. longimucronata* it is more remotely related.

PELLAEA BRIDGESII HOOK.—This species, which seems to have been known only from California, occurs also in Idaho. Specimens at hand were collected by Mr. E. Grandjean (no. 96) in the autumn of 1913 in the Boise National Forest, on rocky hillsides of the divide between the Salmon and Payette Rivers. In California this species ranges in the Sierra Nevada from Nevada County southward to Mineral King, Tulare County (*Coville & Funston* 1418), at altitudes of 1650 to at least 3300 meters.

PELLAEA BREWERI D. C. EATON.—The distribution of *P. Breweri* has recently been stated by Butters⁴ as "from the Sierra Nevada Mountains, through the basin ranges of Nevada and Utah, to the Blue Mountains of Oregon, central Idaho, and western Wyoming." This range may be definitely extended to include Washington, on the basis of a single collection in the National Herbarium (Yakima region, 1883, *Tweedy* 20). There are, in addition, published records for New Mexico and Montana, which the writer has been at some pains

⁴ Amer. Fern Journ. 7: 86. 1917.

to clear up. Thus, as late as 1893, Eaton, in the Botany of the Death Valley Expedition,⁵ indicates the range as "extending to the Belt Mountains of Montana, and to New Mexico at Loma, on the Rio Grande." Both the Montana and the "New Mexico" specimens, in the Eaton Herbarium, have been examined by the writer through the courtesy of Prof. Alexander W. Evans, and both belong to the puzzling western aggregate associated with *P. glabella* in a varietal sense by Professor Butters. They are very clearly not *P. Breweri*. The Montana specimen was collected in the Belt Mountains by Newberry in 1884.

The "Loma" specimens actually come from southern Colorado, the rather confused history being as follows: In Ferns of the Southwest⁶ Eaton cited *P. Breweri* as from New Mexico (*Loew*) and as having been collected "near Loma in southern Colorado, *Dr. Rothrock* near the headwaters of the Rio Grande." In Ferns of North America⁷ Eaton again mentioned small specimens collected "near Loma in Colorado, near the Rio Grande," here ascribing *Loew* as the collector. The specimens in the Eaton Herbarium are marked in Eaton's hand as collected in New Mexico, by *Loew*, with the locality "Loma, on Rio Grande" written in later. Aside from the foregoing there is no record of the occurrence of either *P. Breweri* or *P. glabella* in Colorado; *Rydberg*⁸ merely lists the former as "reported from Colorado, but exact locality not given." There are at present two localities in Colorado named Loma, neither of them that of the Wheeler Survey. The particular Loma mentioned is apparently a former Mexican settlement shown on old survey maps under this name, located on the north side of the Rio Grande

⁵ Contr. U. S. Nat. Herb. 4: 227. 1893.

⁶ In Rept. U. S. Geogr. Surv. W. 100th Merid. 6: 319. 1879.

⁷ 1: 331-333. 1879.

⁸ Fl. Colorado, 4. 1906.

opposite the present town of Del Norte, in Rio Grande County, Colorado, 30 or 40 miles from the source of the river. In definitely excluding New Mexico and Colorado from the known range of *P. Breweri*, therefore, Colorado is added to the range of *P. glabella*. Whether the collection was by Rothrock or by Loew is uncertain.

A departure from the characteristic 2-lobed or "mitten-shaped" form of the pinnae is mentioned by Eaton in the case of the "Loma" specimen (*P. glabella* var.) erroneously referred by him to *P. Breweri*, the larger pinnae having three or four distinct lobes. Undoubted *Pellaea Breweri*, also, occasionally has a similar development, as shown by a small specimen from Cottonwood Canyon, Utah, in the Eaton Herbarium, and by young fronds in the National Herbarium collected on the Death Valley Expedition, at the north base of Telescope Peak, Panamint Mountains, California, June 23, 1891, by Coville and Funston (no. 2028). Some of the latter are even more subdivided, the proximal basal segment of the larger pinnae being free and itself bilobed. The plants seem otherwise not to differ from ordinary states of *P. Breweri*.

The following collections, chiefly from the interior regions, are additional to those cited by Butters. All are in the National Herbarium:

WYOMING: Special locality wanting, Sept. 4, 1893, *Rose* 325.

IDAHO: Mountains at head of Redfish Lake, alt. 2550-3000 meters, Aug. 22, 1895, *Evermann* 438; Bonanza, Custer Co., alt. 2250 meters, July 25, 1916, *Macbride & Payson* 3433; Smoky Mountains, Blaine Co., alt. 2700 meters, Aug. 13, 1916, *Macbride & Payson* 3758; Blackfoot Canyon, Caribou Forest, Bannock County, alt. 1900-2100 meters, Sept., 1913, *Eggleston* 9995.

UTAH: Mount Nebo, Aug. 15, 1905, *Rydberg & Carlton* 7742; Ogden Canyon, Ogden, Aug. 19, 1913, *A. E. Hitchcock* 1440; locality wanting, 1875, *Parry* 94.

OREGON: Gayhart Buttes, alt. 2200 meters, Aug. 9, 1896, *Coville & Leiberg* 301; locality wanting, 1883, *Cusick* 516.

WASHINGTON: Yakima region, 1883, *Tweedy* 20.

PELLAEA ATROPURPUREA (L.) LINK.—An extension of range is noted in specimens of the Biltmore Herbarium, recently presented to the National Museum. These were collected at Crestview, Walton County, Florida, in crevices of limestone rock, Sept. 26, 1899, *Biltmore Herb.* 755a. This species has been collected frequently in Georgia, but has not hitherto been known from Florida.

PELLAEA ASPERA (HOOK.) BAKER.—This is one of the very rarest and least known of the Mexican Border ferns. It was described originally by Hooker, as *Cheilanthes aspera*, on Texas specimens collected in 1849 by Charles Wright, and has since been collected in only a few localities. In its specific characters it is highly individual, the most conspicuous peculiarity being its strongly scabrous upper surfaces. The roughness is due to the presence of rather numerous short, white, stiff hairs which arise at intervals from inflated conical bases in groups of two or three, following the course of the immersed veins. The leaf tissue of the living plant is presumably delicate, for the segments are transversely waved toward the edge, the tissue apparently shrinking between the veins, in drying, and about the base of the hairs. The ridges are thus minutely tuberculate from the presence of the elevated, wholly persistent, rigid hair-bases. The hairs increase in size and number toward the enlarged tips of the veins, but do not quite reach the whitish, re-

curved margin of the segments. The margins are herbaceous and denticulate-ciliolate.

The generic position of this plant has been regarded as doubtful; but in habit and most essential characters, such as vestiture and the definitely thickened vein-ends, it belongs to *Cheilanthes* rather than *Pellaea* and may accordingly be transferred to that genus as *C. horridula*,⁹ the new species name being required under *Cheilanthes*.

The following specimens are in the National Herbarium:

TEXAS:¹⁰ Crevices of rocks on hills, Turkey Creek, June 25, 1849, *Wright* 824 (type collection); high stony hills of the Pecos, June 1, 1851, *Wright* 2127; near mouth of the Rio Pecos, Oct., 1883, *Havard*; Sanderson, Pecos Co., Sept. 29, 1911, *Wooton*.

NEW MEXICO: "Near the Copper Mines," Grant Co., *Mex. Bound. Survey* 1581 in part.¹¹

ARIZONA: "Head of the Rio San Pedro, Nov. 5, 1850," *Mex. Bound. Survey* 1581 in part.

CHIHUAHUA: Rocky hills near Chihuahua, Oct. 31, 1885, *Pringle* 447 (4 sheets).

COAHUILA: Mountains north of Monclova, Sept., 1880, *Palmer* 1422 (2 sheets).

DURANGO: "El Mundo Hill," Lerdo, alt. 1650 meters, Nov. 25, 1911, *Chaffey* 58 in part.

WASHINGTON, D. C.

⁹ *Cheilanthes horridula* Maxon, nom. nov.

Cheilanthes aspera Hook. Sp. Fil. 2: 111. pl. 103. A. 1852, not Kaulf. 1831.

Pellaea aspera Baker in Hook. & Baker, Syn. Fil. 148. 1867.

Pellaea scabra C. Chr. Ind. Fil. 172. 1905, not *Cheilanthes scabra* Karst. 1854.

¹⁰ For locality data of *Wright* 824 and 2127 the writer is indebted to Mr. C. A. Weatherby, who has looked up the records in the MS list of Wright's 1849 and 1851 collections at the Gray Herbarium.

¹¹ Eaton's record of this number (in Torrey, U. S. & Mex. Bound. Bot. 234. 1859) is as follows: "Lower Rio Grande, *Schott*; near the Copper Mines and along the San Pedro, *Bigelow*." The National Herbarium